

BEST AVAILABLE COPY

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
9 June 2005 (09.06.2005)

PCT

(10) International Publication Number
WO 2005/051636 A1

(51) International Patent Classification⁷: **B29C 59/02.**
HO1L 21/31

(21) International Application Number:
PCT/US2004/035078

(22) International Filing Date: 22 October 2004 (22.10.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/520,599 17 November 2003 (17.11.2003) US

(71) Applicant (for all designated States except US): DOW CORNING CORPORATION [US/US]; 2200 West Salzburg Road, Midland, MI 48686-0994 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): KATSOULIS, Dimitris [—/US]; 5810 Wildflower Circle, Midland, MI 48642 (US). ZHU, Bihong [CN/US]; 1212 Marriet Court, Midland, MI 48642 (US).

(74) Agent: TROY, Timothy, J.; Patent Department - Mail CO1232, Dow Corning Corporation, 2200 West Salzburg Road, Midland, MI 48686-0994 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM,

AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

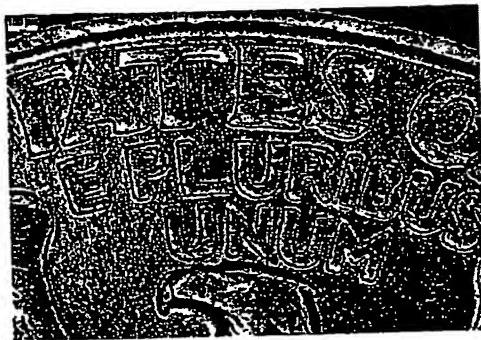
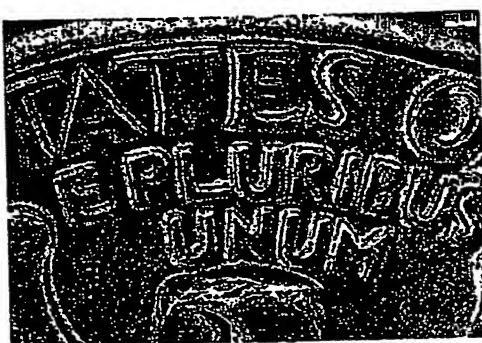
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for all designations
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ,

[Continued on next page]

(54) Title: METHOD OF EMBOSsing CURED SILICONE RESIN SUBSTRATES



(57) Abstract: This invention relates to a method of embossing a cured silicone resin thermoset substrate to imprint patterns onto the substrate from a master mold comprising (i) stacking a master mold with a cured silicone resin thermoset substrate such that the surface of the master mold containing a feature is facing the silicone resin substrate; (ii) applying pressure to the product of (i) in a press at a temperature slightly higher than the Tg of the silicone resin but lower than the softening point of the master mold; (iii) cooling the product of (ii) and maintaining the pressure on the mold; and (iv) releasing the substrate whereby the feature is imprinted on the silicone resin substrate. Cured silicone resin thermoset substrates offer advantages over the organic thermoplastics in terms of hot embossing lithography by offering a very smooth surface which promotes high fidelity of replication in the micrometer and nanometer domain, and requiring no release agent for demolding.

WO 2005/051636 A1

BEST AVAILABLE COPY